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## REVIEW

### Integrative review on administration of drugs in nursing care

Revisão integrativa sobre administração de medicamentos na assistência de enfermagem

Revisión integradora acerca de administración de medicamentos en la atención de enfermería

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### ABSTRACT

**Objective:** Analyze the publications focusing on the administration of drugs in nursing care which were made available in the databases within the period from 2007 to 2011. **Method:** This is an integrative review study carried out in databases of the Virtual Health Library (LILACS and SciELO), in May and June 2011. **Results:** In the discussions stood out: training with the aid of the virtual learning environment through distance education, errors in prescriptions which led to errors in drug administration, and importance of prevention to avoid mistakes. **Conclusion:** If the prescriptions are prepared having guidelines, recommendations, and team training as a basis, besides communication between the professionals, one may say that the risks related to errors in drug administration tend to sharply decrease. **Descriptors:** Administration of drug therapy, Nursing care, Nursing.

### RESUMO

**Objetivo:** Analisar as publicações enfocando a administração de medicamentos na assistência de enfermagem que foram disponibilizadas nas bases de dados no período de 2007 a 2011. **Método:** Trata-se de um estudo de revisão integrativa realizada nas bases de dados da Biblioteca Virtual da Saúde (Lilacs e SciELO), em maio e junho de 2011. **Resultados:** Destacaram-se nas discussões: capacitação com auxílio do ambiente virtual de aprendizagem por meio da educação a distância, erros nas prescrições que levaram a erros na administração de medicamentos e importância da prevenção para evitar erros. **Conclusão:** Se as prescrições forem elaboradas com base em orientações, recomendações e treinamento da equipe, além da comunicação entre os profissionais, pode-se dizer que os riscos relacionados a erros na administração de medicamentos tendem a diminuir acentuadamente. **Descritores:** Administração de terapia medicamentosa, Assistência de enfermagem, Enfermagem.

### RESUMEN

**Objetivo:** Analizar las publicaciones enfocando la administración de medicamentos en la atención de enfermería que se volvieron disponibles en las bases de datos en el de periodo 2007 a 2011. **Método:** Esto es un estudio de revisión integradora llevada a cabo en las bases de datos de la Biblioteca Virtual de Salud (Lilacs y SciELO), en mayo y junio de 2011. **Resultados:** Se destacaron en las discusiones: capacitación con la ayuda del ambiente virtual de aprendizaje por medio de la educación a distancia, errores en las prescripciones que llevaron a errores en la administración de medicamentos e importancia de la prevención para evitar errores. **Conclusión:** Si las prescripciones fueren preparadas bajo orientaciones, recomendaciones y entrenamiento del equipo, además de la comunicación entre los profesionales, se puede decir que los riesgos relacionados con errores en la administración de medicamentos tienden a disminuir drásticamente. **Descriptores:** Administración de terapia medicamentosa, Atención de enfermería, Enfermería.

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## INTRODUCTION

The administration of drugs in a health care institution is a complex and multidisciplinary process, in which all professionals involved aim to provide the patient with a good quality care, safely and effectively. The organization of the drug administration process at a hospital institution, the effectiveness and safety offered to patients, depend on the therapeutic plan management established by the nurse in charge and the multidisciplinary team's commitment.

Regarding the complexity of drug administration in the multidisciplinary team, one has to think of the current health care system's challenge, characterized by the technological revolution and the high specialization level in this context.

Basically, this team consists of physicians, responsible for the prescriptions of drugs, nurses, responsible for the administration of drugs, and pharmacists, responsible for the manipulation of drugs. In the function of physician, the prescription, besides being readable, must meet the patient's needs, something which requires a diagnostic analysis feasible according the patient's reality. Regarding the nurse, her/his function requires thought and practice of professional judgment for analyzing the drugs which will be administered. The pharmacist, by handling and distributing the medication, helps the whole team through the identification of the patient's data, check of the correspondence of doses, and evaluation of components with regard to the stability, compatibility, and possible interactions.

This way, one can observe that this process involves a lot of attention, including communications between the team, and it's very important, since a failure at any phase of the process can cause disturbances to the whole multidisciplinary team and even to the patient, thus leading to errors in the administration of drugs<sup>1</sup>, which can cause major problems.

In order to have a safe and good quality assistance in the administration of drugs, it's needed that the communication system is effective, allowing the multidisciplinary team to relate in a clear and correct way and the information to be transmitted among all professionals.<sup>1</sup>

Multidisciplinary communication, whether verbal or nonverbal, coming from the record, must provide relevant information on the patient and qualify the assistance provided. Furthermore, as a basic instrument for care, it must reflect abilities compatible with the multidisciplinary team's performance.<sup>2</sup>

Another relevant point refers to adverse effects, which are undesirable implications due to the use of a drug. Adverse effects may involve toxic effects or side effects. A toxic effect is an adverse effect emerging as a consequence of the intensification of the same pharmacological effect responsible for the drug's therapeutic effect; therefore, it's an effect related to the dose. A side effect refers to an adverse effect which emerges through some pharmacological reaction different from that producing the therapeutic effect (these effects may be related to the dose or not).<sup>3</sup>

In medication therapy, some information is needed in order to understand any adverse effect, namely: the adverse reaction which may be due to losses related to medication at doses commonly used in man for prophylaxis, diagnosis, and/or treatment of a particular disease; any error in medication which will be defined as a failure in the drug administration process, that may be related to prescription, preparation, administration, and monitoring; potential errors can also occur, that is, events which actually happened, but without causing harm to the patient, since the error has been corrected in time or the dose administered wasn't harmful.

Adverse effects are those unexpected and which cause harm or injury to the patient, either by use or non-use of any drug when needed.

So, by identifying what are the most common mistakes of the nursing team (nurse, technician, or assistant) at the time of administering a drug, there's a need for identifying the risk factors leading to such errors and take preventive measures to avoid them as much as possible.<sup>4</sup>

Regarding the ethical aspect, the nurse must prepare and administer intravenous medications, solutions, and any other kind of drug to be administered to the patient, since, this way, she/he will avoid administrative penalties, which are due to poor patient care. These penalties are provided for in the Code of Ethics of Nursing Professionals.<sup>5</sup>

According to the Code of Ethics of Nursing Professionals, ruled by the Resolution COFEN 311, enacted in 2007, the nurse should be ethically, scientifically, technically, and legally competent to perform her/his tasks in a safe way, without damages due to malpractice, negligence, or recklessness. These are some of the basic principles of nursing care.<sup>6</sup>

Besides, the nursing professional, in accordance with the Law 7,498, enacted on June 25, 1986, has as an exclusive activity the following tasks: planning, organizing, coordinating, performing, and evaluating the nursing care services; prescription of nursing care; direct nursing care for severe patients with life-threatening risk; more complex technical nursing care procedures and those requiring science-based knowledge and ability to make immediate decisions. These exclusive activities highlight the responsibilities with regard to the specific tasks of the nurse's professional practice in the administration of drugs.<sup>7</sup>

Thus, given these considerations, this paper aims to analyze the publications focusing on the administration of drugs in nursing care which were made available in the databases from 2007 to 2011.

This study proved to be relevant for research and teaching of Nursing, due to recurring errors in the administration of drugs and the severe consequences that these errors can bring, causing problems to the team and, especially, to the patient. The range of the theme is also relevant, because this is a study involving multiple professions and, although often discussed and reported, few scientific studies discuss the problem.

## METHODOLOGY

In order to enable the development of this study, an integrative review was carried out. The data collection period was from 05/20/2011 to 06/18/2011 and the following databases of the Virtual Health Library were used: Latin American and Caribbean Literature on Health Sciences (LILACS) and Scientific Electronic Library Online (SciELO).

The integrative review is a method which provides a synthesis of knowledge and the applicability of results from significant study in practice.<sup>8</sup>

Another relevant aspect is that the integrative review is the broadest methodological approach regarding reviews, allowing the inclusion of experimental and non-experimental studies to look for a comprehensive understanding of the phenomenon analyzed. It also combines data from theoretical and empirical literature, besides incorporating a broad range of purposes: definition of concepts, review of theories and evidence, and analysis of methodological problems of a particular topic. The large sample, along with the multiplicity of proposals, must generate a consistent and understandable overview of complex concepts, theories, or health problems relevant for nursing.<sup>8</sup>



It's noteworthy that the following descriptors were used: administration of drug therapy; nursing care; nursing.

The criteria for inclusion of studies were: adhere to the proposed aim; published between 2007 and 2011; address the theme administration of drugs within the nursing area.

One conducted an initial fluctuating reading of studies and, therefore, out of the 14 studies found in LILACS, only 5 had adherence to the proposed aim; out of the 36 references found in SciELO, 11 had adherence and they were used according to the inclusion criteria set.

In the database SciELO, among the 11 selected studies: all were related to the knowledge field health and nursing. Therefore, by performing an in-depth reading, one observed that the 11 selected studies addressed, indeed, errors in the administration of drugs. In the database LILACS, 5 studies were selected and all of them were used. Therefore, 16 studies were evaluated, being 11 (68.75%) from SciELO and 5 (31.25%) from LILACS.

In this context, the integrative review provides professionals from various areas of expertise in health with quick access to relevant research results which ground the conducts or decision-making, constructing a critical knowledge.<sup>9</sup>

## RESULTS AND DISCUSSION

For analyzing the information, the content found was organized by year, type of publication and methods/techniques used, the essence of content and knowledge production, in addition to the authors' recommendations.

Therefore, regarding the amount of studies per year, one has the following results: from 2011 no studies were found which met the criteria set. However, there was 37.5% of studies from 2010; 18.75% from 2009; 18.75% from 2008; and 25% from 2007. This demonstrative indicates that, within the period from 2007 to 2011, there was a small increase in the number of publications related to errors in the administration of drugs, taking into account the nursing care issues and the iatrogenic situations.

By analyzing the kind of publication related to the kind of method and research techniques used, one found out that 43.75% of the studies involve descriptive and exploratory research; 25% of the studies are literature reviews; 6.25% of the studies addressed collected of data; 6.25% of the studies were conducted through the literature review.

This trend demonstrates the importance of developing researches on the theme of administration of drugs and its implications for nursing professional practice and, consequently, for the clientele.

Moreover, still thinking of the kind of publication, 6.25% of the studies were developed through experimental research; 6.25% of the studies are descriptive and retrospective; and 6.25% are cross-sectional descriptive studies. Within this period, most of the publications were aimed at the research with a descriptive and exploratory design, to the detriment of the other modalities.

Concerning the essence of content and knowledge production, one found out that 18.75% of the studies showed a tendency of training with the aid of virtual learning environment through distance education; 18.75% of the studies showed many errors in the prescriptions; and 12,5% of the studies reported the importance of prevention.

Errors in the administration of drugs were surveyed by checking the medical prescriptions (time, dose, and presentation of drugs supplied by the pharmacy). This is an attitude which aims to decrease failures in the administration of drugs. It's worth highlighting that nursing is the last link in

the drug administration process, and its actions may prevent possible errors, or not. Besides, there's the very report of error by the patient. The patient will only know what is being administered if the nursing professional tell what drug will be administered, dose, route, among other information. The patients are beginning to participate more in their drug therapy and end up recognizing the drug by color, shape, consistency, and, this way, start helping to prevent errors. The error detected in the prescription term, a moment which requires careful attention, it leads the professional to detect and prevent new errors, in addition to the delivery of wrong drugs from the pharmacy.<sup>10</sup>

Aiming at the prevention of these errors, among others, it's important to take into account the written and electronic prescription, when it's possible (for being legible), or a prescription which is consistent with regard to the client's need, use of a code for drugs and patient identification, indication of unit dose, preparation of a drug always observing the basic principles of drug administration, for chemical safety, notification of adverse effects, multidisciplinary interaction (pharmacy, physicians, and nurses), and ongoing prescription review.

The development and implementation of distance learning courses for training the nursing professionals constitute a relevant keynote, as it promotes, through the information and communication technologies, an education which seeks interactivity, stimulates research, encouraging the active participation of nursing professionals, thus, it also contributes so that the patients have a differentiated nursing care.

The preparation and planning of this kind of education were conducted in accordance with the activities to be implemented by the students. Many kinds of student/student and student/teacher interaction were designed, such as, for instance: support for reading, frequently asked questions, among others. This allowed a better learning way, more dynamic and comprehensive.<sup>11</sup>

Still thinking of the essence of content, 6.25% of the studies conducted a data collection of doubts among the nursing team; 6.25% report categorization of papers and journals on the theme of drug administration; 6.25% of studies were conducted through questionnaires applied to the nursing team to evaluate its knowledge on drug administration; 6.25% reported labor accidents during drug preparation; 6.25% showed the nurse's guidelines, actions and activities in drug administration; 6.25% of the studies reported that the nurse her/himself who prepared the drug must administer it; 6.25% of the studies report various methods, techniques of drug administration to patients with nasogastric tube; and 6.25% of the studies reported that nursing still shows to be traditional in the face of advances in drug administration.

According to the studies analyzed on labor accidents at a micro-region in Minas Gerais, Brazil, the professionals from various age groups are related to academic training, poor professional qualifications, and excessive workload, among others. These labor accidents damage the health professional's image, since they're preventable and, however, they aren't prevented, thus making the patient's health care poor.<sup>12</sup>

The analysis of studies related to the primary cause of errors in medication administration shows that the main kinds of errors involve: doses; unapproved drugs; schedule and technique; route; prescription, among others. However, one observed that the drug administration process is applied in accordance with the protocol of each hospital institution, therefore, it varies from one to another.<sup>13</sup>

One realized according to the studies analyzed, that 25% of errors in drug administration are related to the lack of interaction between the multidisciplinary team, to the lack of enough knowledge to solve any potential problem at the time of administering the drug. Within these 25%, one found out many labor accidents which are also related to the lack of prior knowledge on the part of this nursing team at the time of drug administration.

According to the studies, one can realize that when technical and scientific knowledge isn't being applied in accordance with the parameters regulated by the agencies responsible for Nursing and that it's taught by Higher Education and High School institutions, then, they end up having a deficit in knowledge and previous guidelines soon become needed on the part of the professional in charge of the team, in order to avoid mistakes at the time of drug administration.

As evidenced, 18.75% of the studies addressing the teaching/learning model through the various existing media, such as, for instance, the internet, videos, among others, which have been used to assist in distance learning and they have shown to be useful, with positive results. Thus, one can realize that the various communication ways are very useful nowadays for education, in any field of knowledge.

The distance learning proposal through new technologies, observed in the studies, showed to be useful for education and training of nursing professionals, leading them to improve and insert themselves into the labor market gradually. However, one can observe that distance learning through various media has helped the nursing professionals to improve themselves.

With this, one can see that the media are essential tools for distance teaching/learning, since they'll promote the worker's health through teaching concerning personal protection, and also other nursing practices, and thus they'll assist in changes in lifestyle. This teaching process through media must be continuous and progressive.<sup>14</sup>

An error in medication may cause or lead to inappropriate use of certain drugs or even cause injuries to the individual. The errors in prescriptions cause damages to the patient's health, and, this way, it's important to prevent in order to avoid these mistakes. The drug administration process involves several members of the multidisciplinary team. However, the nurse has the key role in the preparation and administration of drugs, this way, full attention is essential for the prevention of errors.<sup>15</sup>

One found out that 6.25% of the studies present technicians and assistants who have doubts regarding the drug administration, so, they look for the nurse in charge of the institution or the sector to solve these doubts, however, when these doubts aren't solved, the likelihood of occurrence of errors at the time of drug administration increases.

These health professionals may face legal actions due to negligence, recklessness, and even malpractice or inability at the time of drug administration. This reality has been changed by many hospitals through training, guidance on standards and procedures for these health professionals. This will lead to a decrease in errors at the time of administering drugs and it'll lead to a better conduct of these nurses and nursing technicians and assistants.<sup>10</sup>

The doubts of nursing assistants and technicians on drug administration, observed in the studies analyzed, the generic name or trademark, the similarity of names may be doubt factors for these professionals. There're also doubts on the medical prescriptions. With this, the pharmacist is a major source to solve doubts, however, not the most adequate, since there're doubts related to drug administration and only the nurse will be able to solve them.<sup>16</sup>

Regarding the authors' recommendations, one found out that 18.75% of the studies report that the internet and other media are crucial for distance teaching/learning.

Concerning the other recommendations, one found out that 6.25% of the studies address the following items: teamwork (multidisciplinary); increase in the number of published papers; prescriptions and records with more information on the medication; greater technical and scientific knowledge for obtaining a smaller amount of errors; greater attention to disposal of material and drug administration; drug therapy and general guidelines; search of factors leading to errors in drug



administration; improved communication between the nurse and the patient; compliance with the Code of Ethics of Nursing Professionals; correct technique for administering medications; increase in the number of staff employees; preparation of strategies and recommendations to avoid errors; and a more assistance-based therapeutics.

Regarding one of these studies, one found out that the multidisciplinary work is of paramount importance for the existence of a good and appropriate labor environment. Thus, there's a greater interaction between the team, leading to a decline in the number of errors of the nursing team, coordinated by a nurse.

Many recommendations are important for improving communication and ensuring proper administration of drugs to the patient; among these recommendations one finds: implementation of electronic prescription; patient's identification with wristbands or bracelets; guarantee of a pharmacist in the team; among others.<sup>1</sup>

Through these studies, one can observe that the vast majority of errors in drug administration are due to lack of technical and scientific knowledge, errors in preparation and disposal of material, and lack of communication and previous guidelines concerning drug therapy. However, if such errors are avoided with guidelines, recommendations, and team training, a better communication between the professionals, then, the labor environment will become better and the risks related to errors in drug administration will sharply decrease.

## CONCLUSION

Indeed, one realizes that many challenges within the drug therapy domain are related to the nursing team. And one of the most important goals is reducing errors in drug administration through the knowledge on causal factors and the creation of strategies to solve the problem. The administration of any kind of medication requires from the nurse a scientific and technical knowledge basis, besides professional skills to perform the drug therapy.

The fundamental principles of drug administration by the nurse include: evaluate whether the prescribed drug is correct; evaluate the patient's ability for her/his self-administration of drugs; determine the best time to administer the drug; and monitor the drug's effects. The nurse who prepares the drug must administer it, instead of delegating this task to nursing assistants and technicians. These procedures helped a lot for reducing errors in the drug therapy, something which will lead to an improved nursing care.<sup>15</sup>

However, in addition to the factors presented, in order to reduce errors in drug administration, one must take into account the professional's workload, the number of professionals working in the sector, in-service training through continued education, and the professional's training to practice the activity. These factors, once properly taken into account, will help preventing errors and labor accidents, leading the nursing work to become increasingly better and more respected.

Professionals' update, technique's development, effective communication between the professionals, good labor conditions, and respect for the regulating agencies allow the effective administration of drugs, avoiding errors as much as possible.



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